



A&S: 2000 The Story of Dinosaurs

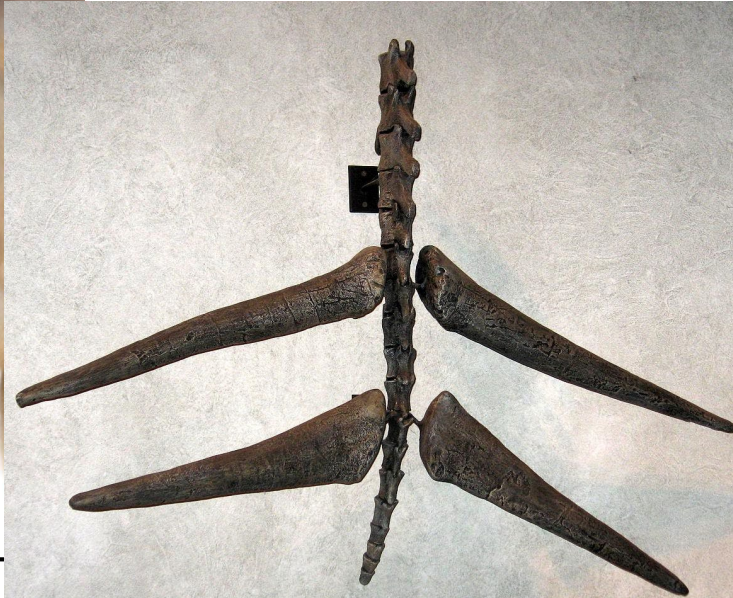
7: Stegosaurus



30 Second Reflection



- You know the Stego.
- What are some of the most iconic features?



"Now this end is called the thagomizer ... after the late Thag Simmons."

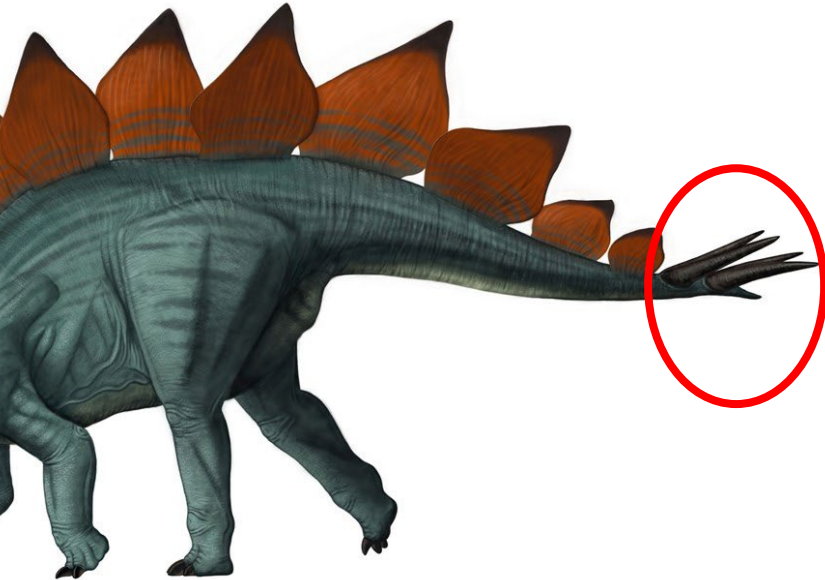


- Kingdom Animalia
 - Phylum Chordata
 - Subphylum Vertebrata
 - Class Reptilia
 - Subclass Diapsida
 - Infraclass Archosauromorpha
 - Superorder Saurischia
 - Order Theropoda
 - Order Sauropodomorpha
 - Suborder Prosauropoda
 - Suborder Sauropoda
 - Superorder Ornithischia
 - Order Ankylosauria
 - Order Stegosauria
 - Order Ceratopsia
 - Order Pachycephalosauria
 - Order Ornithomimorpha

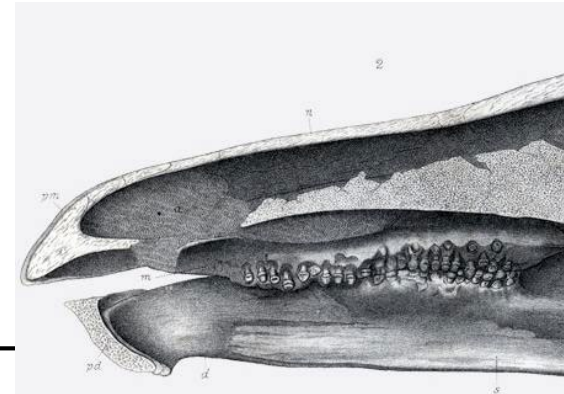


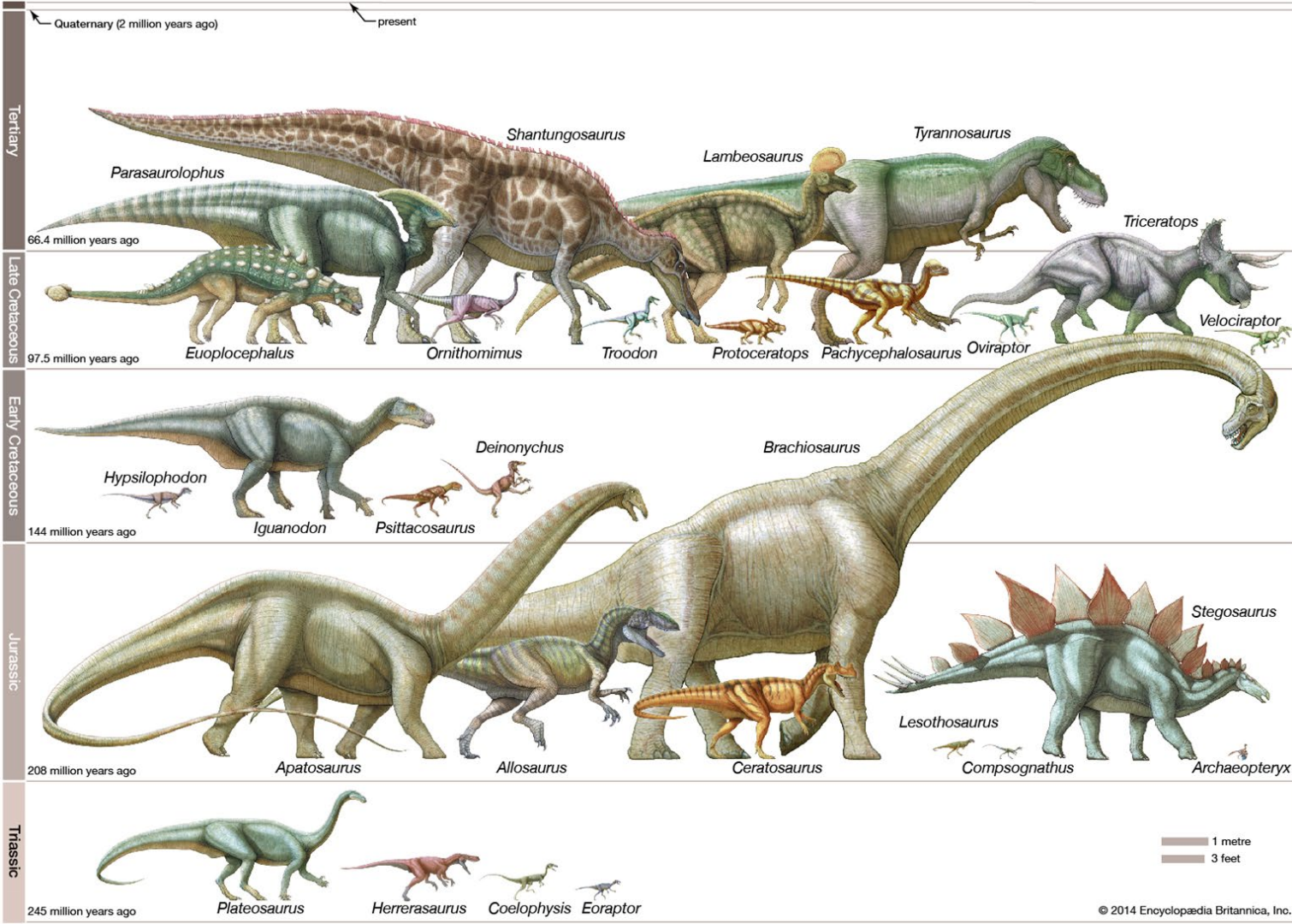


Meet Stegosaurus



- Quadrupedal
- When did it live?
- What did it eat?
- Intelligence?

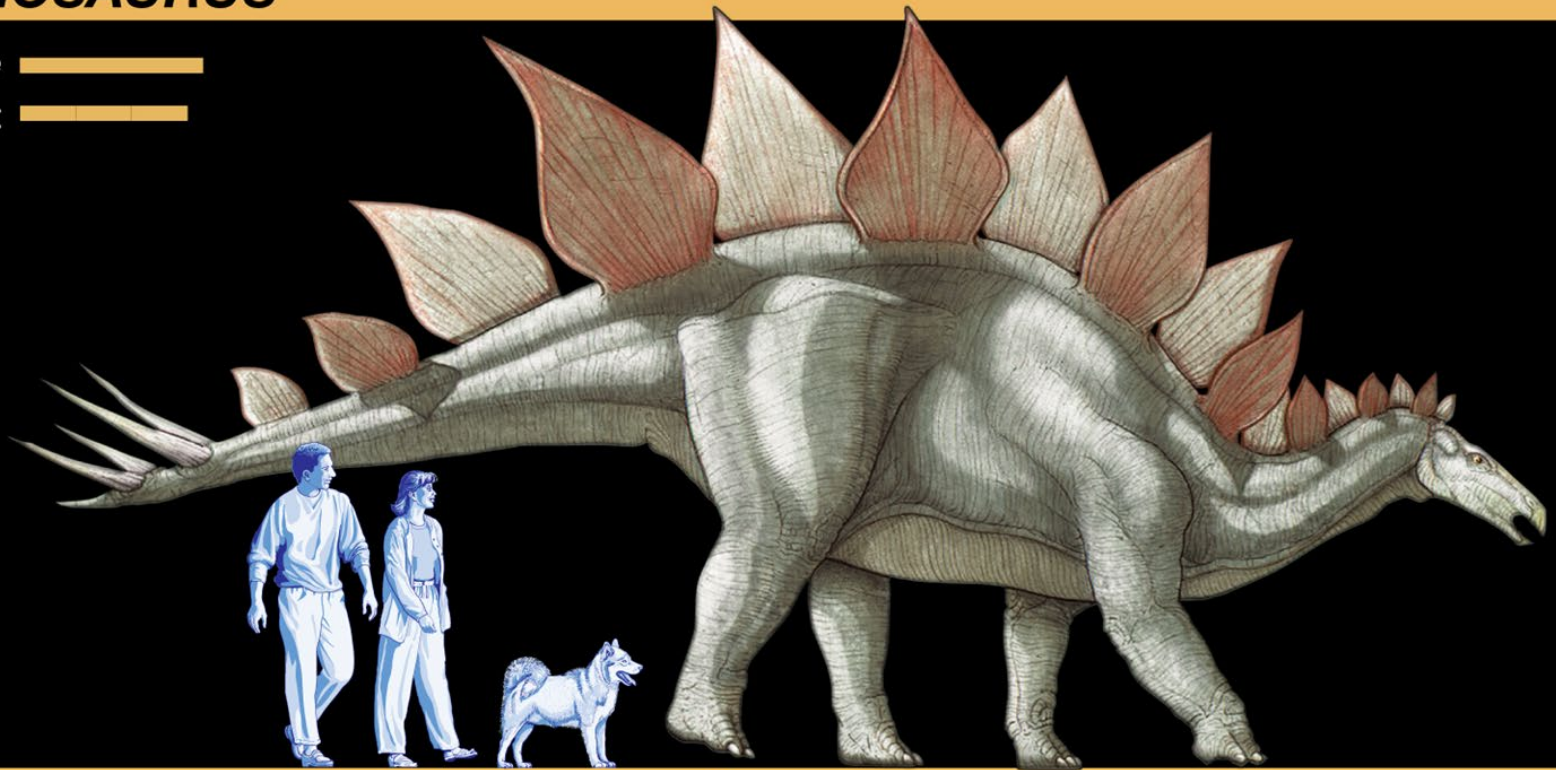




STEGOSAURUS

1 metre 

3 feet 



Stegosaurus (STEG-oh-SORE-us)
“roof lizard”

Period: Late Jurassic

Length: 30 feet (9 metres)

Location: North America

The largest known plated dinosaur, this herbivore had two rows of tall bony plates running along its back.



Thagomizer



- Very mobile tail
 - Estimates in some that they could swing it as fast at 10m/s or 22mph
 - <https://www.youtube.com/watch?v=8Y58ajRA3CQ>
 - 20mph sprint
 - <https://www.youtube.com/watch?v=92jwhEV6KnM>
 - 25mph car crash
 - https://www.youtube.com/watch?v=SRiGP_Nouc6I
 - <https://www.youtube.com/watch?v=sGiRy9ygg6o>
 - Video Game thagomizer (10:05)
-



Diet



- Beak
- Tooth shape
- Jaw movement up and down
 - Bite force $\frac{1}{2}$ of a golden retriever
- No Evidence of gastroliths



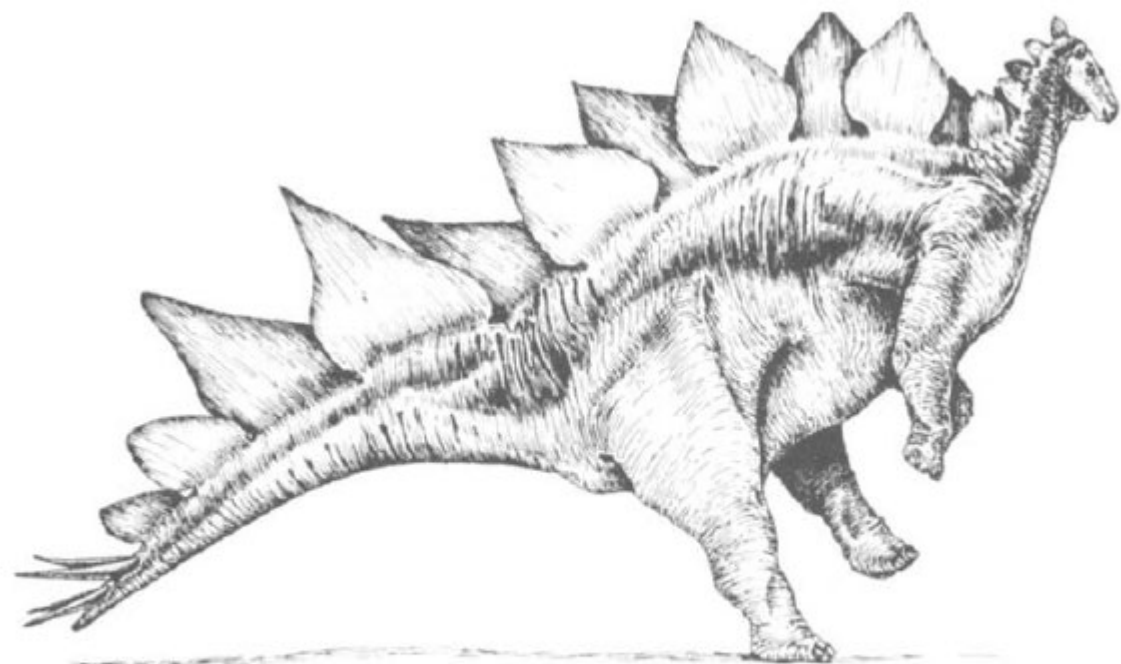
Grasses

- Poaceae is a large and nearly ubiquitous family of modern monocotyledonous *flowering* plants known as grasses...



Mesozoic Vegetation

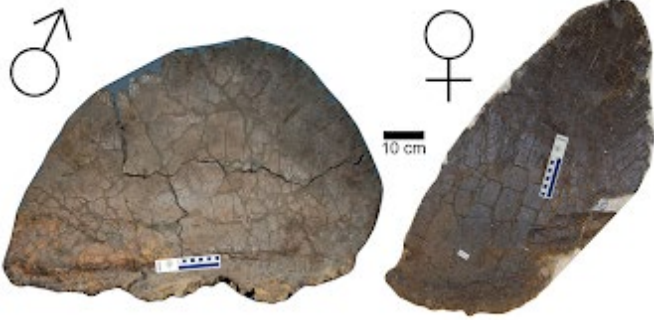




Diracodon laticeps q.13 Como

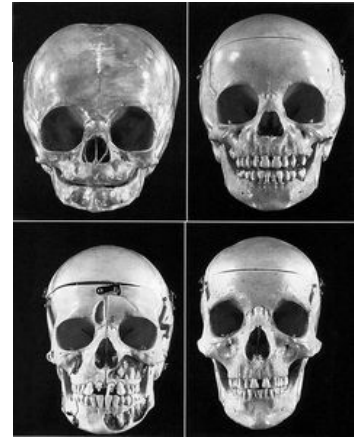
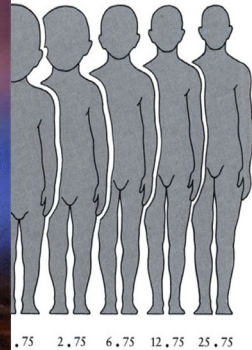
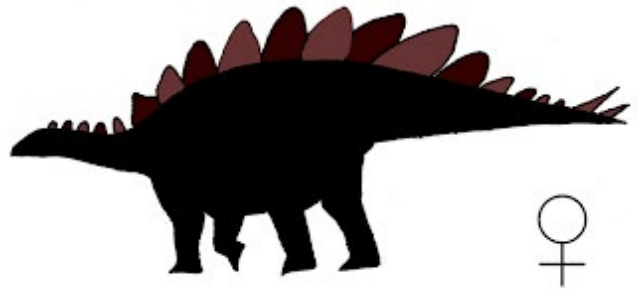
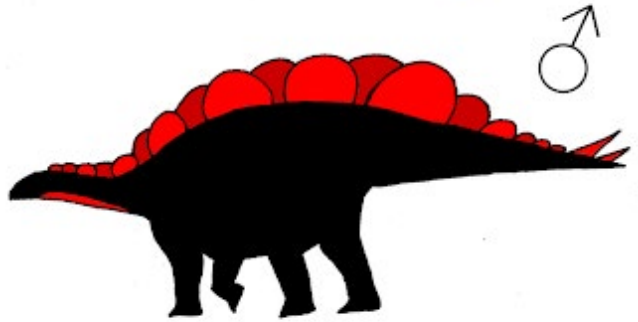
Diracodon laticeps, a three-ton Late Jurassic stegosaur, tilting up its body with a push of a hind foot





Ecophenotypic Variation

- Morphological variation in a population.
- Sexual dimorphism
 - Difference between males and females
 - Passive vs. dominant males
- Ontogeny
 - How shape of animal changes over time as it grows up

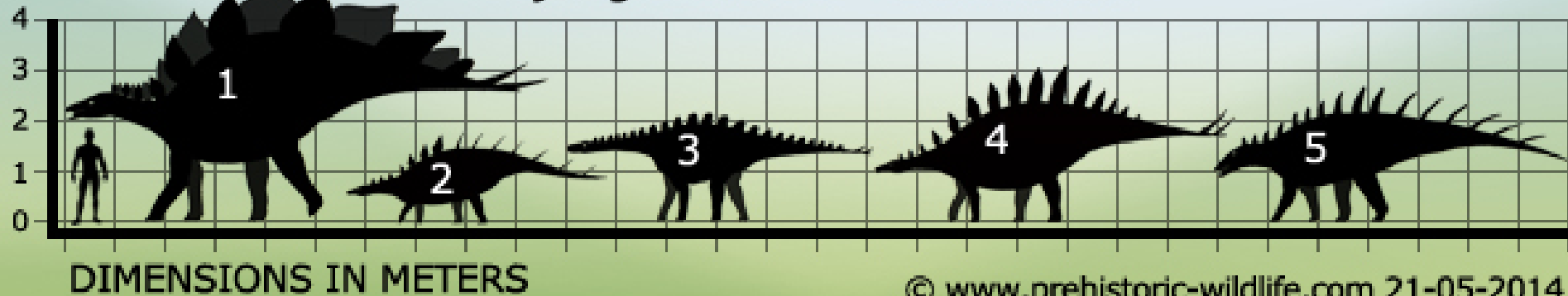




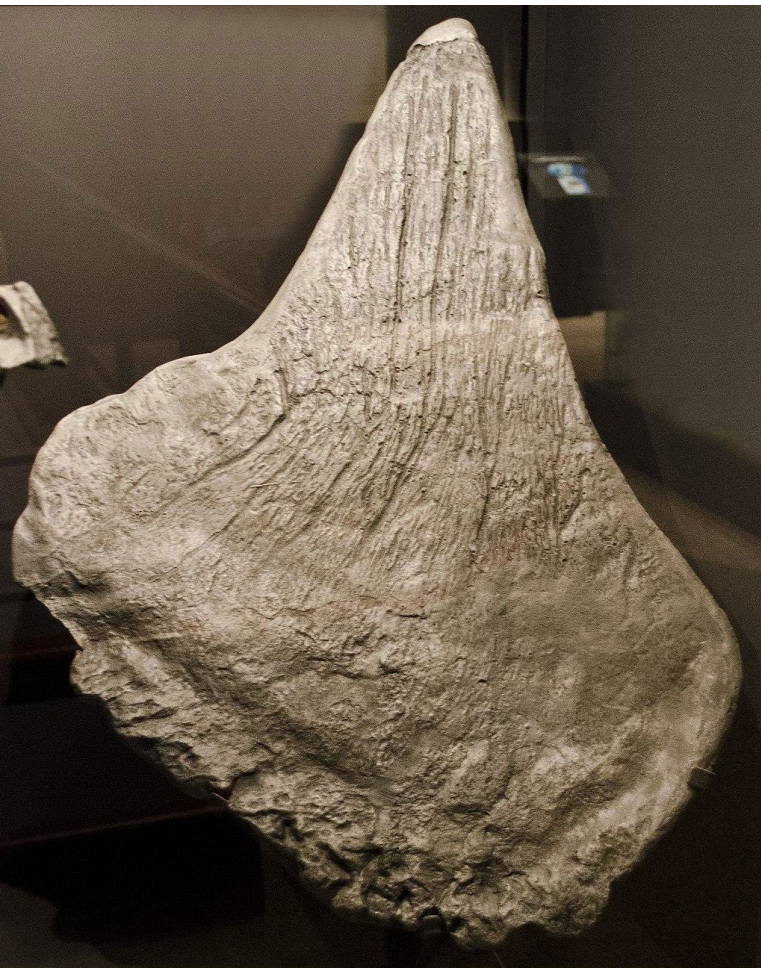
Variation

A few stegosaurs compared to one another, and a 1.8 meter tall person.

1 - *Stegosaurus*. 2 - *Kentrosaurus*. 3 - *Miragaia*.
4 - *Tuojiangosaurus*. 5 - *Dacentrurus*.

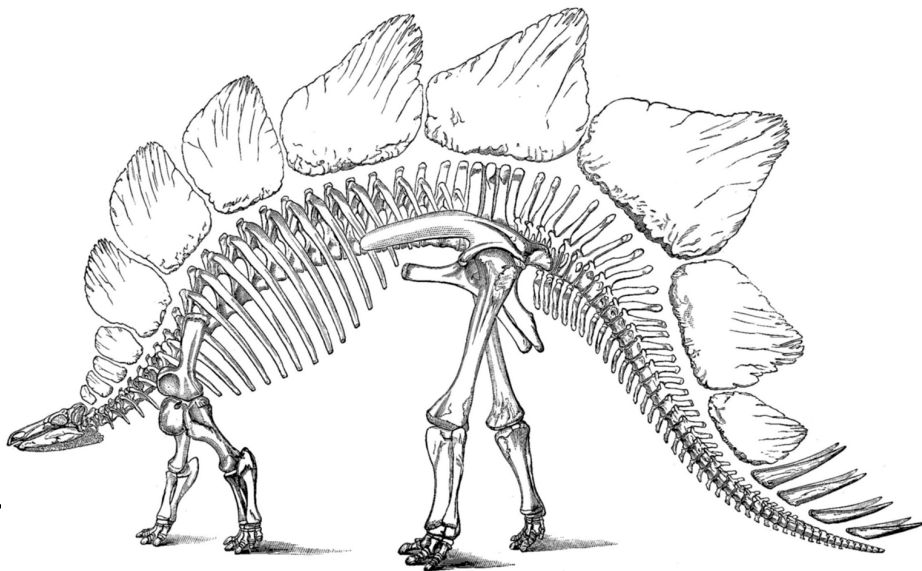


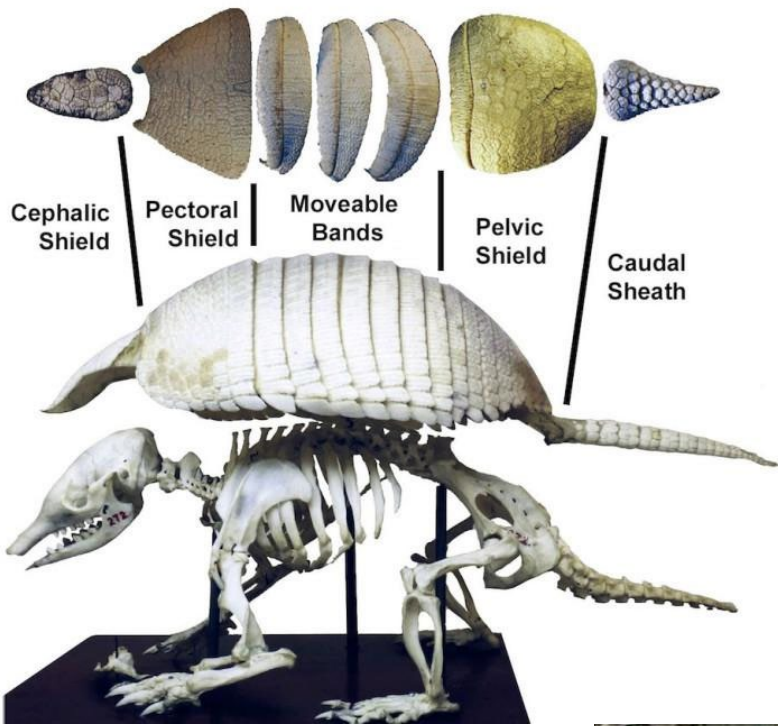
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Plates

- Osteoderms
 - Hard parts in the skin
- Orientation?

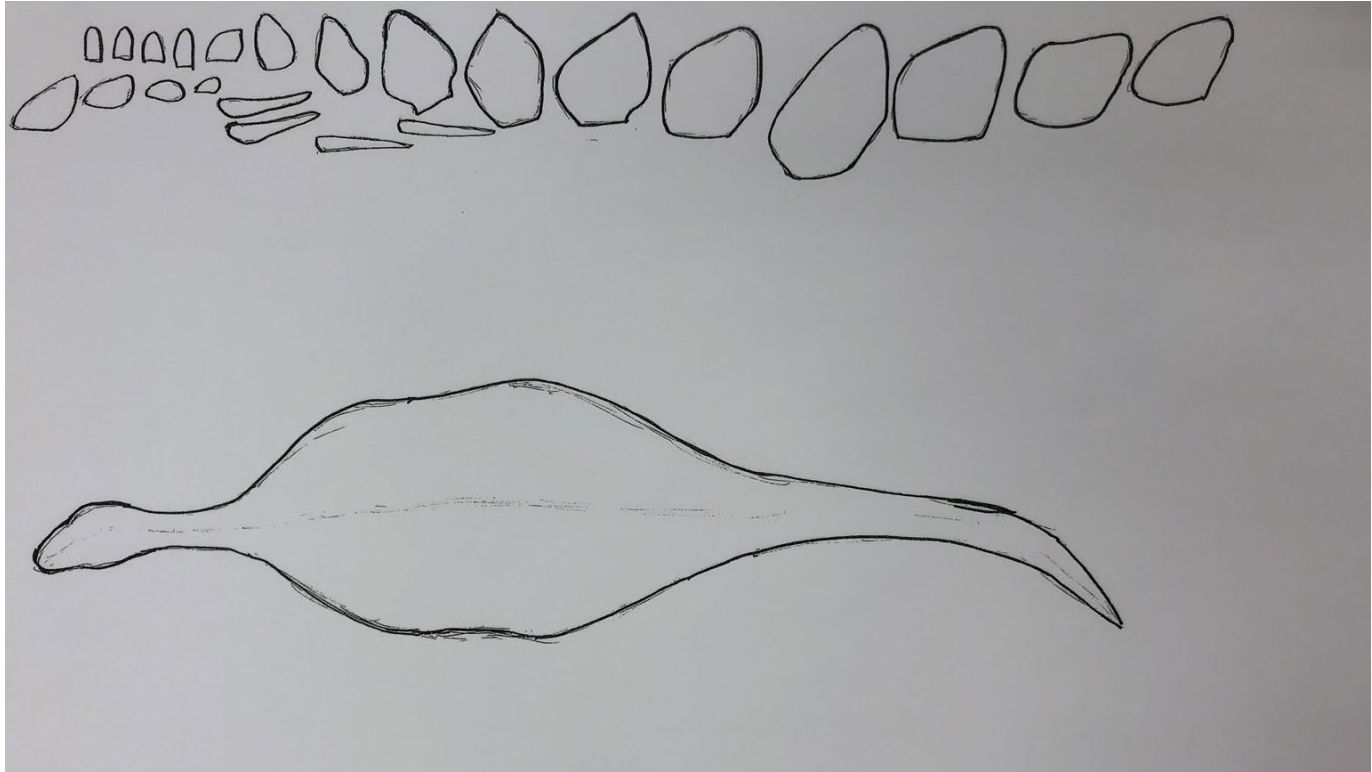




Osteoderms

- bony deposits forming scales, plates or other structures based in the dermis.





Stego Plate Arrangement Exercise



What are they for?

- Thermoregulation
 - Communication
 - Advertisement
 - Defensive Protection
 - Larger body appearance
 - Intimidation
 - Mating
-



Thermoregulation

SMITHSONIAN PREHISTORIC ZOO

Stegosaurus

AMAZING
FACT-FILLED STORY TELLS
HOW PREHISTORIC ANIMALS
SURVIVED AND THRIVED!

by Gerry Bailey Illustrations by Karen C.





Thermoregulation

- Evidence For
 - Blood vessels
 - Cooling climate at end Jurassic
 - CT Scans





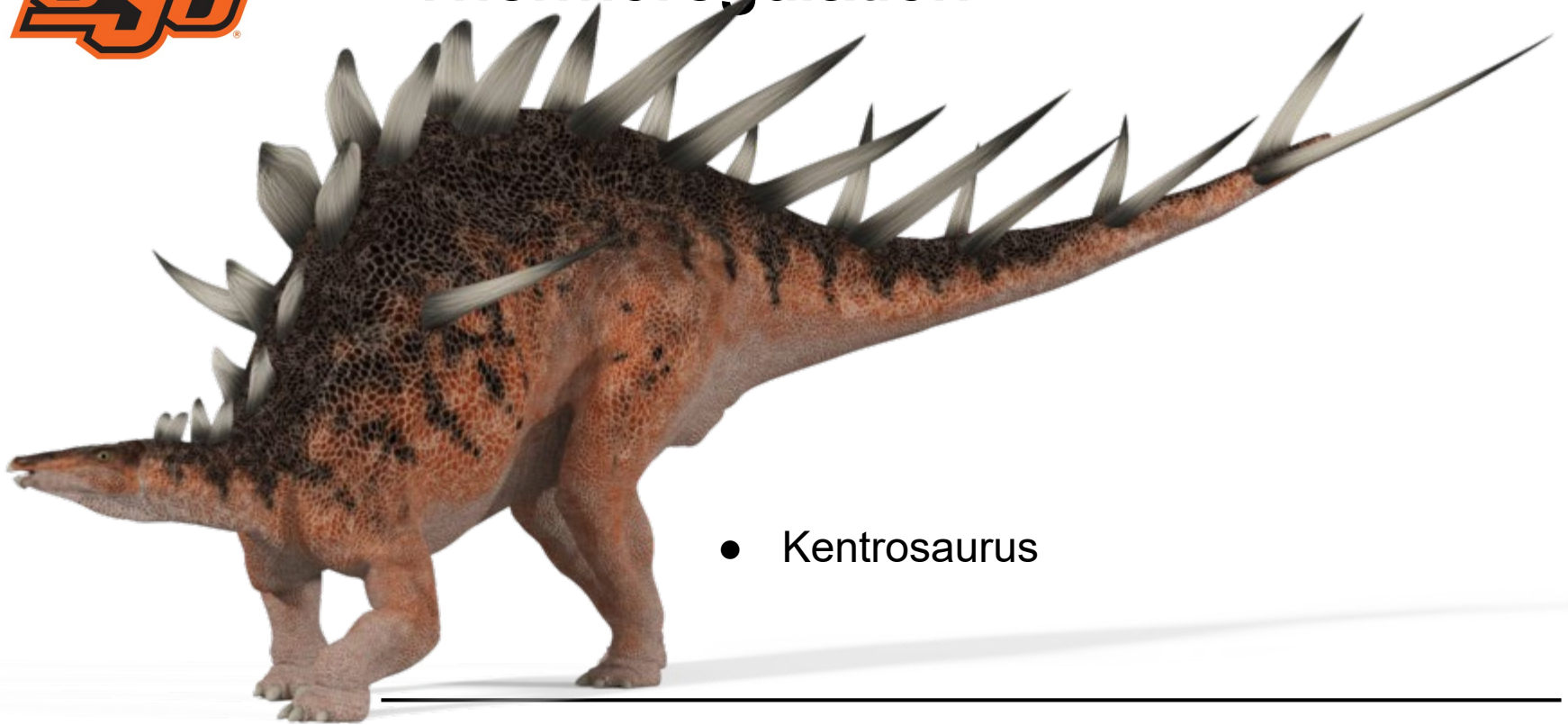
Thermoregulation

- Evidence against
 - What were the plates covered with ?
 - Skin or horn material?





Thermoregulation



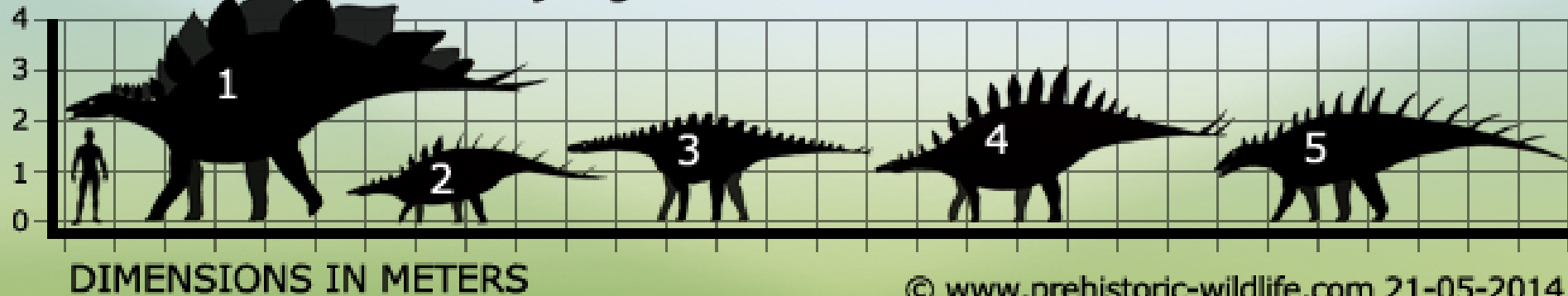
- Kentrosaurus
-



Variation

A few stegosaurs compared to one another, and a 1.8 meter tall person.

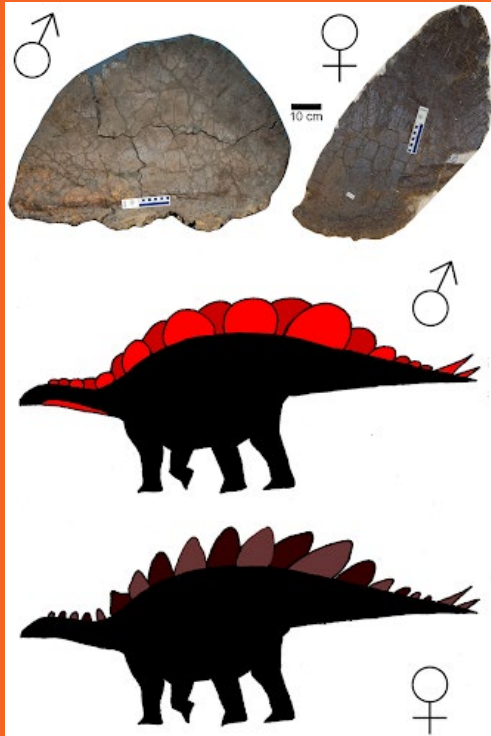
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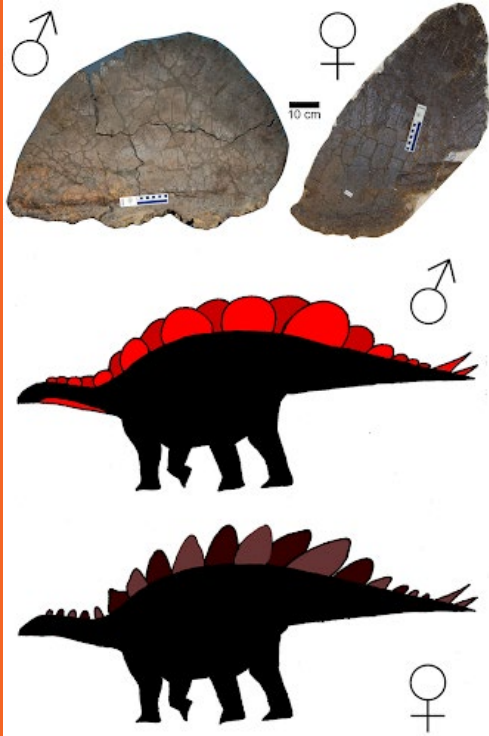


Communication





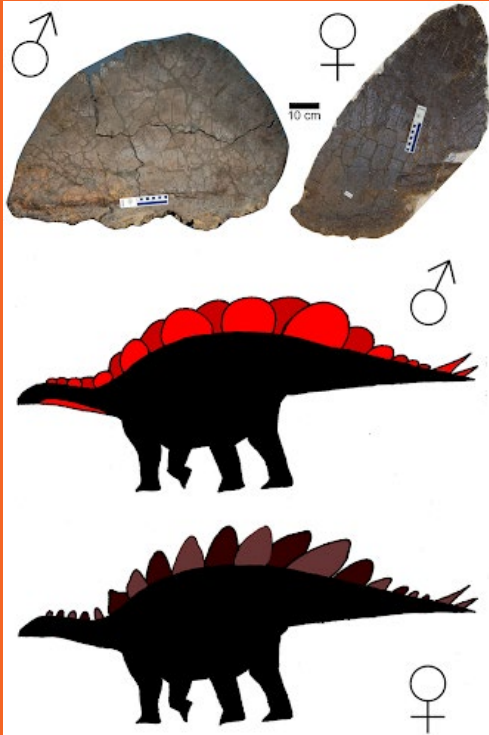
Communication



- Evidence For:
 - Different plate shapes



Communication

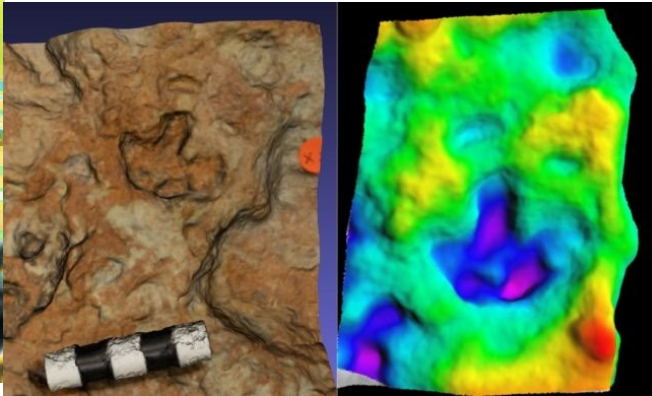
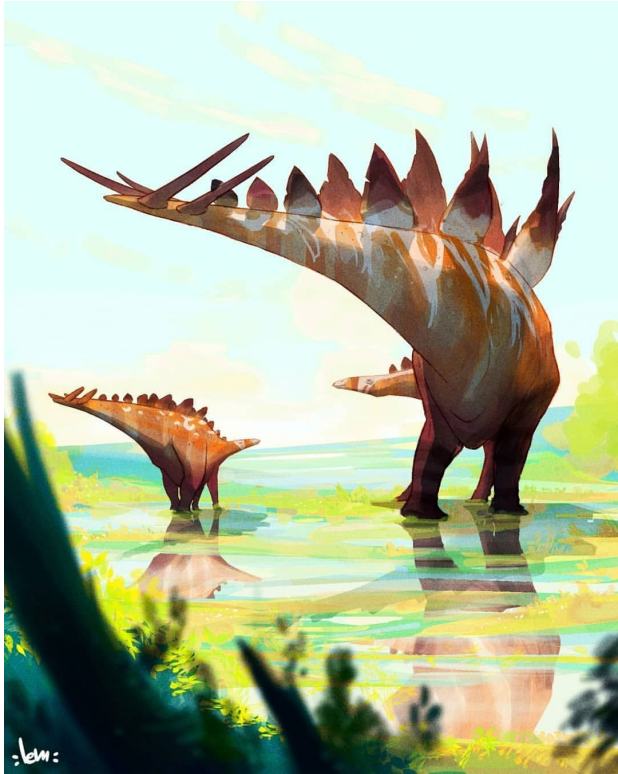


- Evidence Against:
 - Why?



Lonely Stegos?

- If the plates were used for communication
 - Assumption: Would have needed to signal to others from a distance
- Relatively “rare” dinosaurs
 - Number of fossils is relatively small
 - ~80 individuals in Morrison Formation
 - ~60 individual Allosaurus in Morrison





Defense





Evidence For



- Horn covered plates?
-



Evidence Against



- Floppy plates
-



Larger Appearance





Evidence For

- Large size of the plates



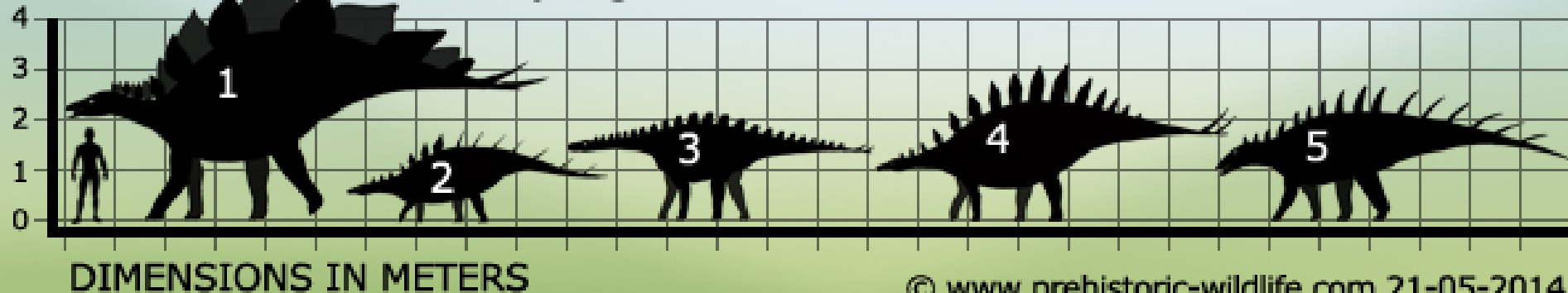


Evidence Against

- Variation in species sizes
 - Not all Stegos are big, some are quite small

A few stegosaurs compared to one another, and a 1.8 meter tall person.

1 - *Stegosaurus*. 2 - *Kentrosaurus*. 3 - *Miragaia*.
4 - *Tuojiangosaurus*. 5 - *Dacentrurus*.





brakken.tumblr.com

Combination of all these?

- Evolution- “survival of the fittest”
 - Darwin didn't actually say that.
 - Not directional
 - Not progressive



newgifs.com





Field Paleontologist Links

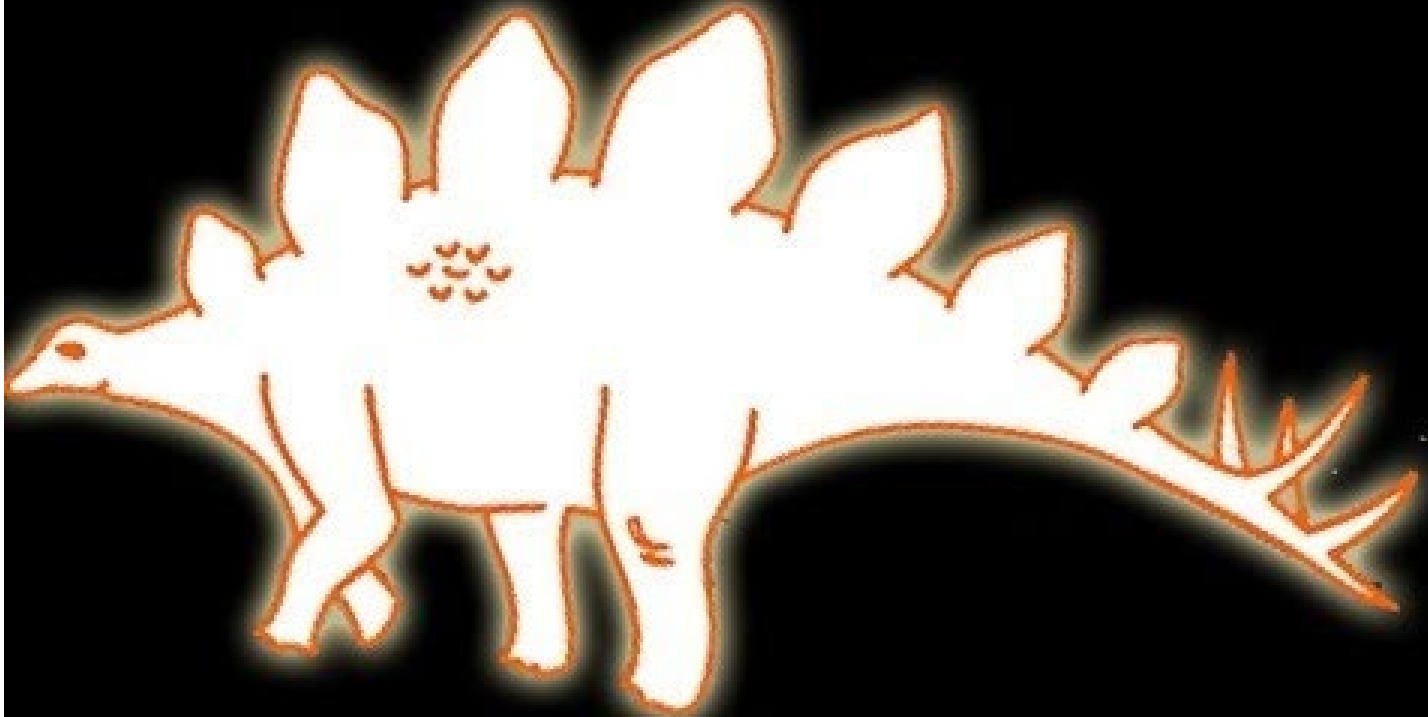
- Stegosaurus Fossils
 - Fossilization
 - [How things fossilize](#)
 - <https://www.nhm.ac.uk/discover/dino-directory/stegosaurus.html>
 - <https://www.smithsonianmag.com/smart-news/oldest-stegosaurus-fossil-unearthed-mountains-morocco-180972949/>
 - <https://www.cnn.com/2019/08/21/world/oldest-stegosaurus-fossil-scn-trnd/index.html>
-



Lab Paleontologist Links

- Experimental Design
 - https://labwrite.ncsu.edu/Experimental%20Design/Exp_PL%20Handout.pdf
- <https://evolution-institute.org/dinobots/>
- <https://www.youtube.com/watch?v=oAFpC1MJ0lo>

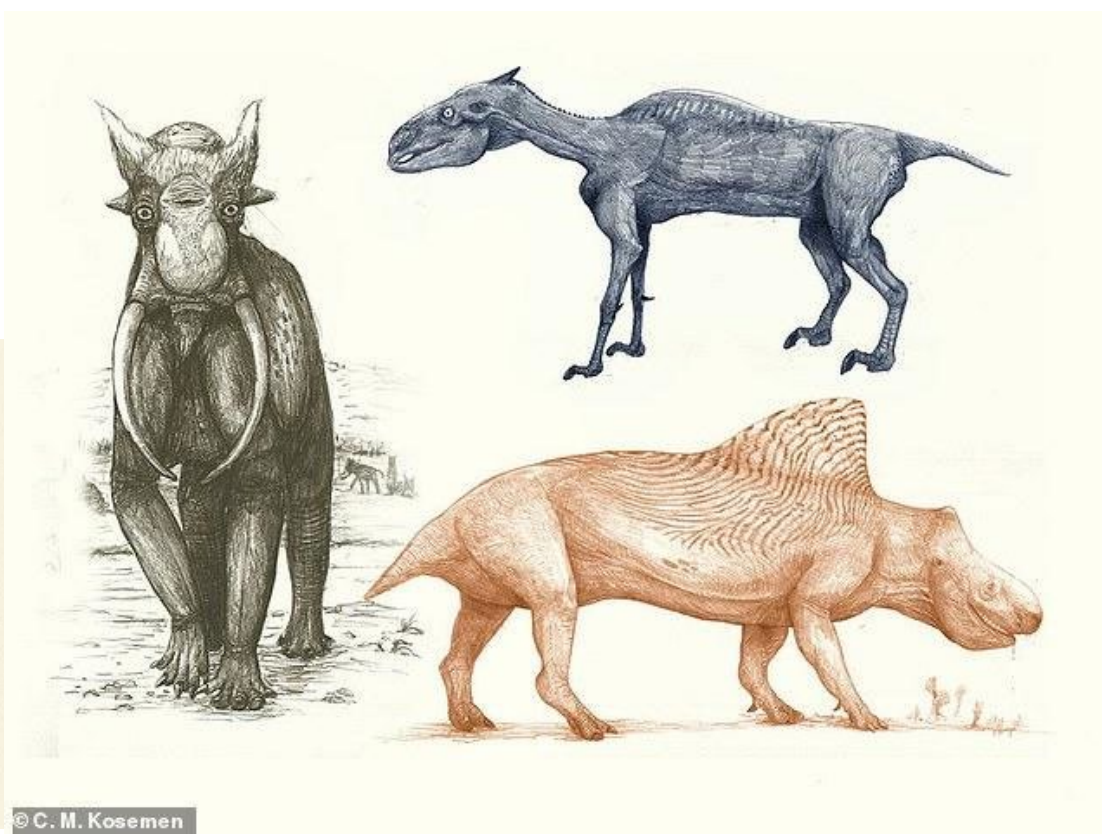
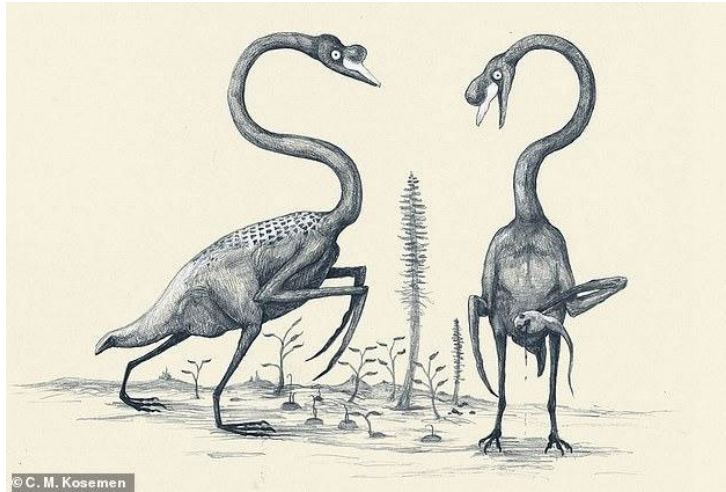




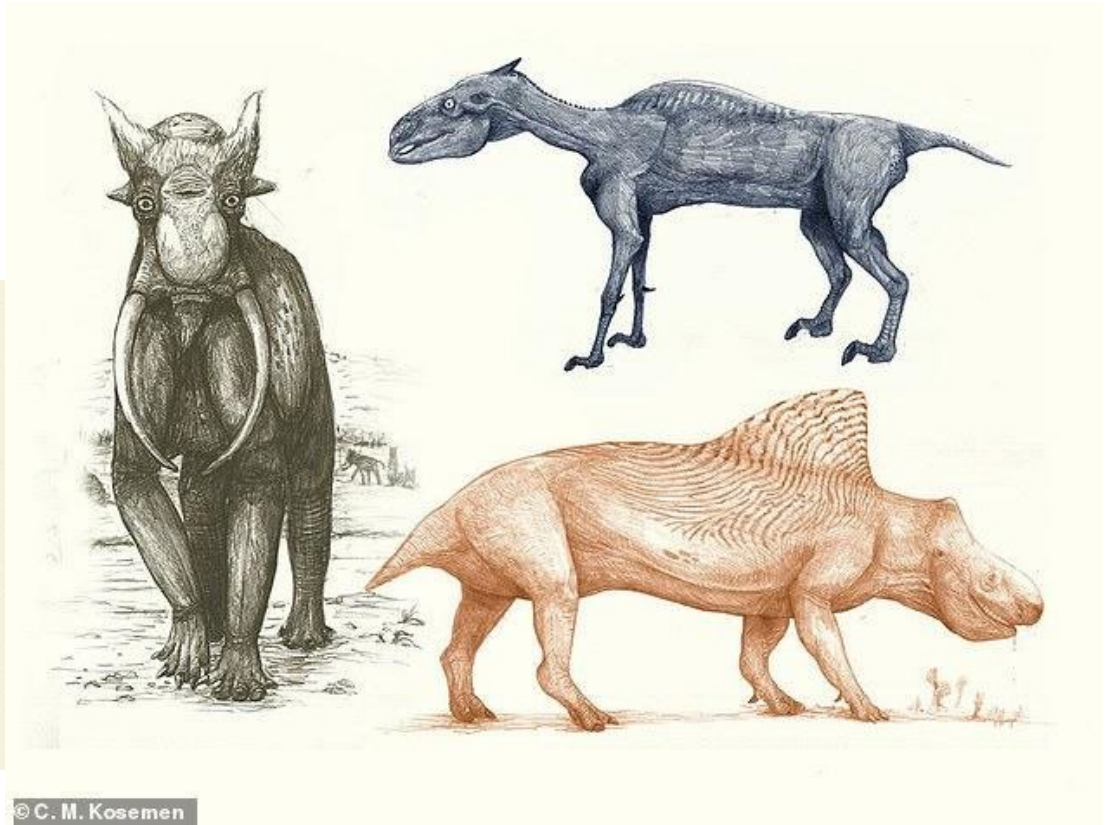
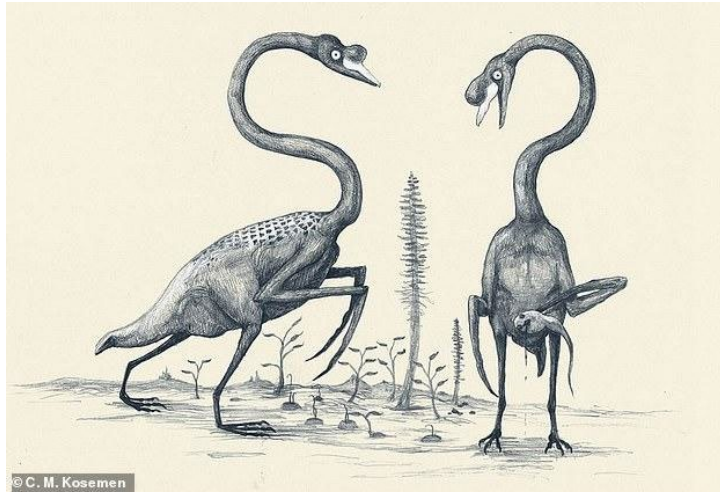


Extra Slides

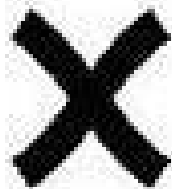
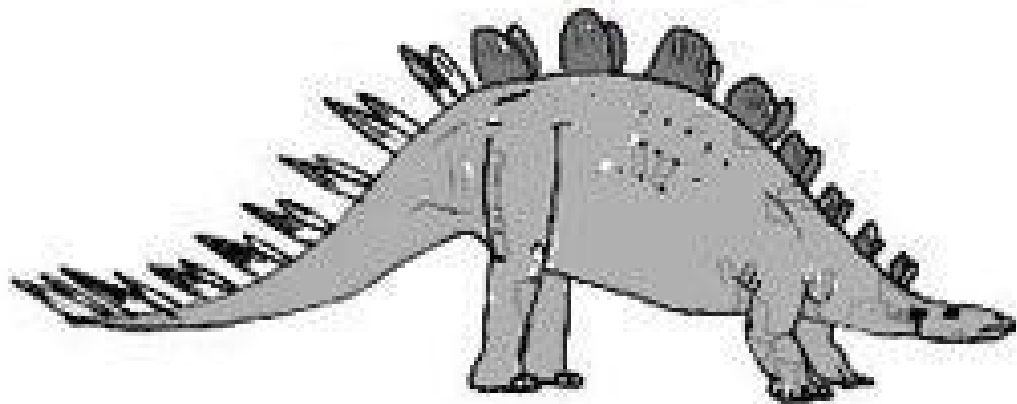
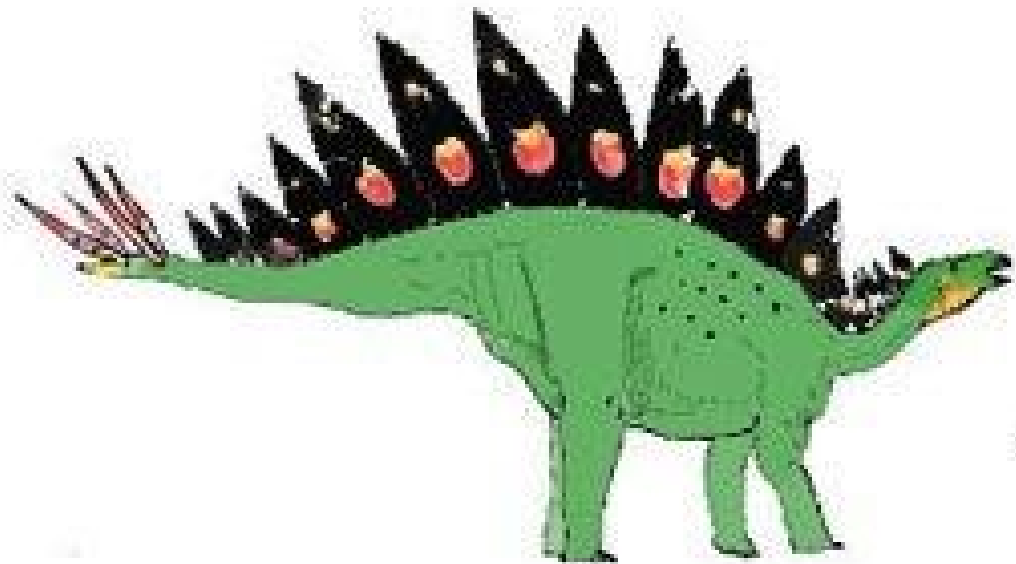




<https://www.dailymail.co.uk/sciencetech/article-7754553/Nightmarish-sketches-reveal-modern-animals-look-like-drew-based-skeletons.html>



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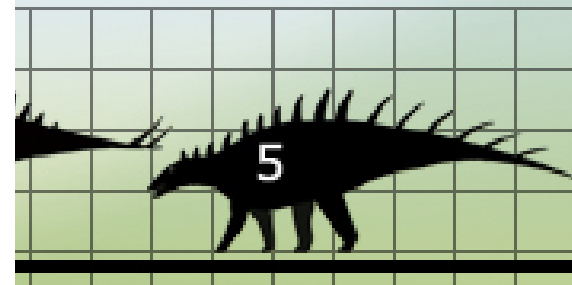


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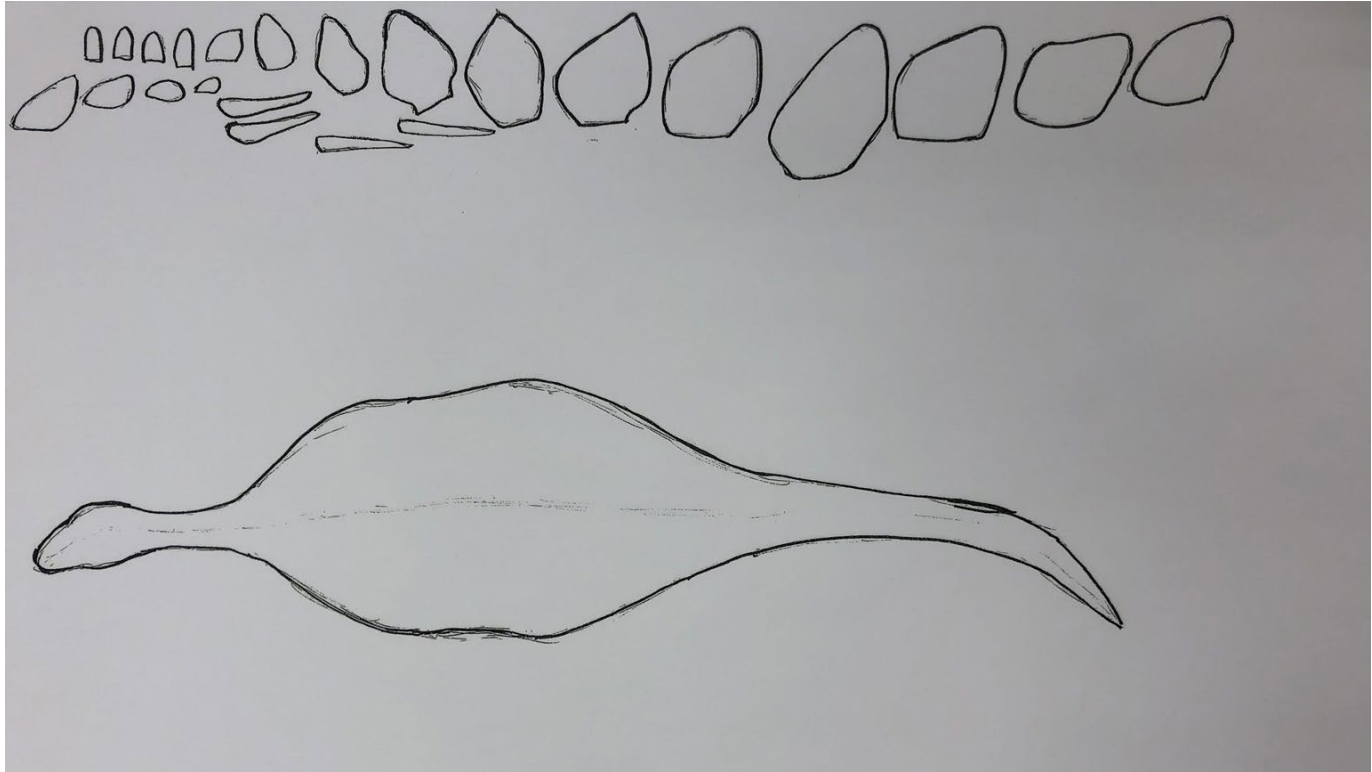
1.8 meter tall person.

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Stego Plate Arrangement Exercise
